DOE/ID-10749
Revision 1
December 2002

U.S. Department of Energy
Idaho Operations Office

Waste Management Plan for Operable Unit 3-13, Group 4, Perched Water

INEEL
Home of Science and Engineering Solutions
Idaho National Engineering and Environmental Laboratory

DOE/ID-10749
Revision 1

Waste Management Plan for Operable Unit 3-13, Group 4, Perched Water

December 2002

Prepared for the
U.S. Department of Energy
Idaho Operations Office

ABSTRACT

This Waste Management Plan identifies the expected waste types and volumes to be generated during the Operable Unit 3-13 Record of Decision for Group 4 (Perched Water) remedial design/remedial action at the Idaho Nuclear Technology and Engineering Center. These activities include the installation of vadose zone instrumentation and monitoring wells, tracer test studies, and initial and routine perched water sampling events. These activities are detailed in the *Field Sampling Plan for Operable Unit 3-13, Group 4, Perched Water Well Installation*. The purpose of this Waste Management Plan is to identify the various waste streams associated with the implementation of this project and to provide guidance for the compliant storage and disposition of these wastes.

CONTENTS

FIGURES

TABLES

ACRONYMS

ARAR	applicable or relevant and appropriate requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
COC	contaminant of concern
ICDF	INEEL CERCLA Disposal Facility
IDEQ	Idaho Department of Environmental Quality
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
IW	industrial waste
IWTS	INEEL Waste Tracking System
LLW	low-level radioactive waste
MCL	maximum contaminant level
MLLW	mixed low-level waste
OU	operable unit
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action
RMA	Radioactive Materials Area
ROD	Record of Decision
RRWAC	reusable property, recyclable materials, and waste acceptance criteria
SAM	Sample and Analysis Management
SRPA	Snake River Plain Aquifer
SSA	Staging and Storage Annex
SSSTF	Staging, Storage, Sizing, and Treatment Facility

USGS	U.S. Geological Survey
WAG	waste area group
WGS	Waste Generator Services
WSA	waste storage area

Waste Management Plan for Operable Unit 3-13, Group 4, Perched Water

1. INTRODUCTION

The Idaho National Engineering and Environmental Laboratory (INEEL) is divided into 10 waste area groups (WAGs) to better manage environmental operations. The Idaho Nuclear Technology and Engineering Center (INTEC) is designated as WAG 3.

Operable Unit (OU) 3-13, which is in INTEC, was investigated to identify potential contaminant releases and exposure pathways to the environment from individual sites as well as the cumulative effects of related sites. Ninety-nine release sites were identified in the OU 3-13 Remedial Investigation/Feasibility Study (RI/FS), of which 46 were shown to be a potential risk to human health or the environment (DOE-ID 1997a). The 46 sites were divided into seven groups based on similar media, contaminants of concern, accessibility, or geographic proximity. The OU 3-13 Record of Decision (ROD) (DOE-ID 1999a) lists remedial design/remedial action (RD/RA) objectives for the seven groups. The seven groups are

- Group 1—Tank Farm Soils
- Group 2—Soils Under Buildings and Structures
- Group 3—Other Surface Soils
- Group 4—Perched Water
- Group 5—Snake River Plain Aquifer
- Group 6—Buried Gas Cylinders
- Group 7—SFE-20 Hot Waste Tank System.

This Waste Management Plan (WMP) describes the characterization, storage, and disposition of waste generated during RD/RA Phase I and Phase II activities for Group 4, Perched Water. These activities include Phase I vadose zone instrumentation, well installation, and sampling; Phase II well installation and sampling; and Phase II routine perched water sampling. These activities are detailed in the *Field Sampling Plan for Operable Unit 3-13, Group 4, Perched Water Well Installation* (DOE-ID 2002a) Potential waste streams from the well installations include industrial waste (IW), low-level radioactive waste (LLW), Resource Conservation and Recovery Act (RCRA) -listed, characteristically hazardous waste, and mixed low-level waste (MLLW). This plan describes the systems and methods for ensuring that the Group 4 waste will adhere to the requirements in the *Waste Certification Plan for the Environmental Restoration Program* (INEEL 1996) along with other federal and state requirements. This plan is a "road map" for characterizing, storing, and disposing waste generated during this project.

Waste material generated during this project is part of the post-ROD activity; therefore, the waste is RD/RA waste and will be managed as outlined in this WMP. All waste will be segregated, containerized, labeled, stored, and disposed in accordance with the applicable or relevant and appropriate requirements (ARARs) identified for Group 4 in the ROD. Waste Generator Services (WGS) and WAG 3 technical staff are responsible for implementing this WMP with support from INTEC personnel.

2. SITE BACKGROUND AND PROJECT SCOPE

The Group 4 perched water wells will be drilled into key stratigraphic units of sediment or interbeds. A phased approach to perched well installation is proposed. During Phase I, the nature and extent of perched water sources around the tank farm and the percolation ponds will be determined. Also included in Phase I activities are tracer test studies and perched water sampling. Phase II activities include well installation and routine sampling activities. Remedial objectives for these wells are defined in the OU 3-13 ROD.

2.1 Phase I Activities

The Phase I wells will be drilled (see Figure 1) to better determine the perched water recharge sources and, in particular, to support the tracer tests. The goal of each tracer test (and the well location selection) is to provide information about the hydraulic connection between the recharge sources and the upper and lower perched water zones.

Perched water sampling will be performed at the three depths of concern: alluvium/basalt interface 9.0 to 13.7 m (~30 to 45 ft), upper perched water (33.5 to 36.6 m [110 to 140 ft]), and lower perched water (115.8 to 128 m [380 to 420 ft]). The deepest well in each set will be drilled first. After the deep well is drilled, it will be geophysically logged. The borehole geophysical logs provide information on stratigraphy and locations of perched water; they will also be used to determine completions for each subsequent well in the set. Drilling of the subsequent wells will be accomplished through reverse air rotary drilling with a conversion to core drilling near the interbeds targeted for sampling. The boreholes will be completed with tensiometers, suction lysimeters, and a piezometer. This approach provides the best control possible for the tracer test.

Soil samples will be collected for analysis of contaminant concentrations, hydraulic properties, and geochemical properties. Additional sample material will be retained for contaminant transport studies (batch and column test) and archival samples for treatability studies.

As a part of this phase, groundwater samples will be collected during the tracer test. Samples will also be collected and analyzed for contaminants of concern (COCs). Actions associated with this task involve well purging and sample collection.

2.2 Phase II Activities

Phase II consists of two specific tasks: (1) the installation of wells to provide moisture monitoring and COCs sampling locations and (2) monitoring the perched water drain out and flux to the Snake River Plain Aquifer (SRPA). The well sets will contain at least three wells, one to be completed in the upper perched water zone, another to be completed in the lower perched water zone, and a third to be completed in the SRPA. Wells at these depths will be instrumented with tensiometers for measuring soil matric potential and with piezometers and lysimeters for the collection of water samples for COC analysis. The aquifer skimmer well will be screened across the water table. Actual completion depth to the bottom of the screen will be slightly below the SRPA water table (~140 m [460 ft]). The skimmer well will be used for sampling aquifer water to determine contaminant flux out of the vadose zone.

The monitoring of the perched water drain out and flux is a requirement of the WAG 3 OU 3-13 ROD. The routine sampling events will continue for at least 5 years after the relocation of the percolation ponds. The scope of these routine monitoring activities are defined in the Group 4 Monitoring System and Installation Plan (MSIP) (DOE-ID 2000).

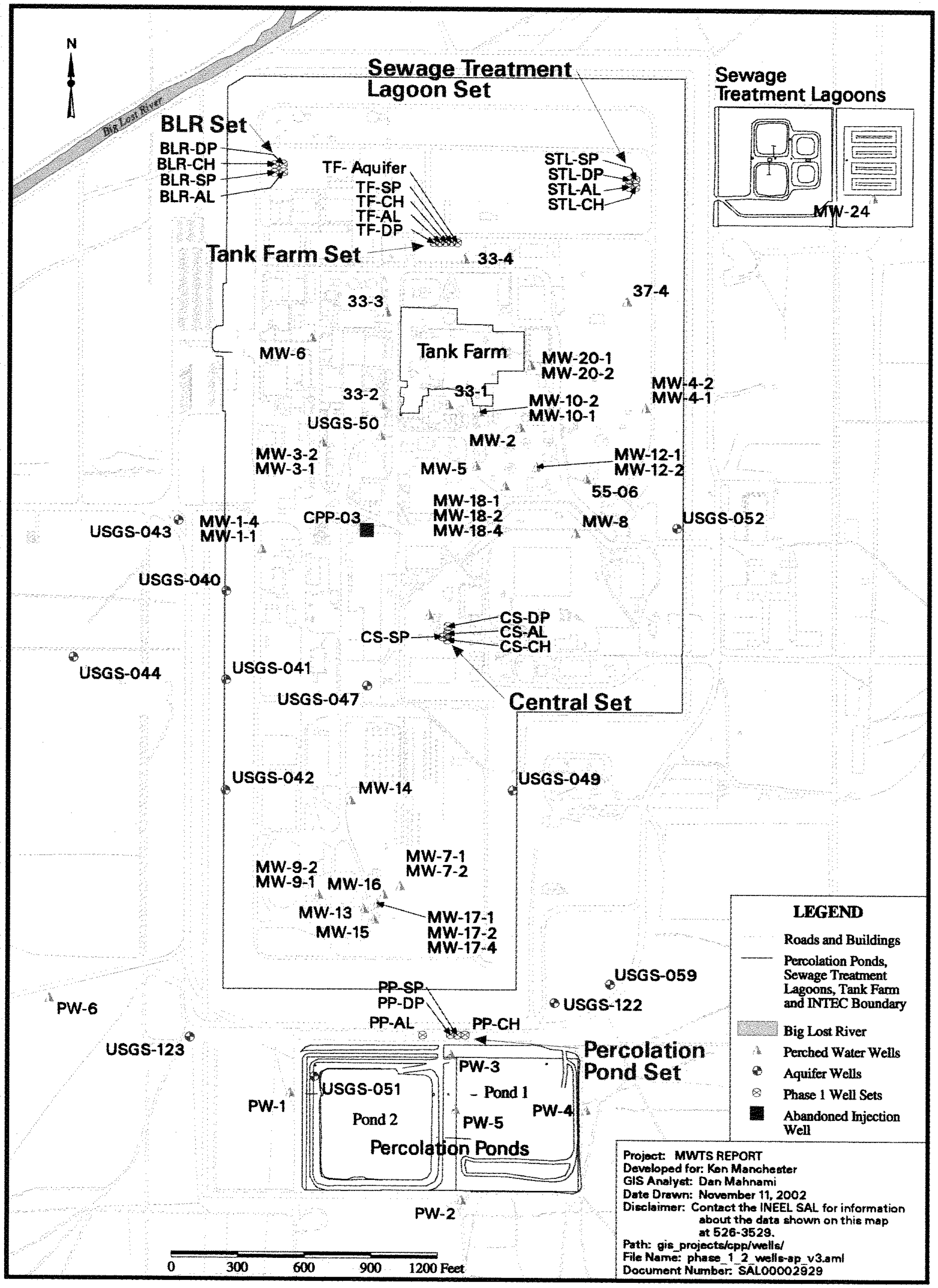

Figure 1. Proposed locations for perched water monitoring wells.

As a part of this phase, an initial round of groundwater samples will be collected. Samples will be collected and analyzed for COCs and water quality parameters. Actions associated with this task involve well purging and sample collection.

2.3 Phase II Routine Sampling

The MSIP (DOE-ID 2000) covers the continued collection of groundwater samples from newly installed and existing wells and lysimeters. This activity will continue for a minimum of 5 years after relocation of the percolation ponds. Actions associated with this task involve well purging and sample collection.

3. PROJECT-SPECIFIC WASTE STREAMS AND VOLUMES

This section describes the 10 distinct waste stream types that will likely be generated during installation and monitoring of the perched water wells. Section 4 has an estimated volume of each waste stream. The waste stream characterization is described in Section 5; guidance for waste stream storage, disposition, and recordkeeping is provided in Sections 6, 7, and 8, respectively.

3.1 Personal Protective Equipment

Personal protective equipment (PPE) in the form of anticontamination clothing will be generated in support of the Group 4 MSIP for OU 3-13. The types and use of PPE are specified in the Group 4 Health and Safety Plan (INEEL 2002). PPE used for this project may include coveralls, shoe covers, boots, gloves, glove liners, hoods, and duct tape. Coveralls and hoods are generally made of paper or Tyvek. Gloves are generally latex or nitrile, and the liners are disposable cloth. Shoe covers and boots are generally polyethylene or rubber. Polyvinyl chloride boots and shoe covers will not be used. Duct tape is used to secure the various layers of PPE. The PPE will be bagged and segregated according to site-specific considerations (for example, zone of saturation, projected waste determination).

3.2 Unused and Unaltered Sample Material

Unused and unaltered sample material from the drilling programs may include excess soil cores from the interbeds, surrounding basalts, and groundwater. Samples of solid environmental media and some aqueous samples (e.g., those for analysis of semivolatile compounds) are typically only chilled between collection and analysis. It is likely that, during field operations, excess material not needed for laboratory analysis may be generated. Groundwater and other aqueous samples (e.g., quality control samples) will be preserved as needed before shipment to the laboratory. During field operations, excess material not needed for laboratory analysis is likely to be generated. For instance, water samples are held pending results from the tracer analysis. If the tracer is not detected, further analysis of these samples is determined to be unnecessary. These unused and unaltered sample materials may be returned to their borehole of origin (and not become a waste), placed in storage at the Staging and Storage Annex (SSA), or added to like materials from the same site being stored at the SSA pending disposition. Unaltered samples returned from a laboratory that are determined to be a waste (samples with no archival value) will be sent to the SSA for management in accordance with that facility's WMP.

3.3 Soil Drill Cuttings

Perched water well activities are expected to generate substantial volumes of drill cuttings. Dual-wall air-reverse circulation technology will be used as the preferred drilling method. Soil drill cuttings are diverted at the surface to ensure complete containment of all cuttings. The cuttings will be discharged through a cyclone-type separator. The cuttings coming out of the cyclone separator can be deposited into waste drums, roll-off boxes, or other suitable waste containers. Water will be injected at the cyclone for dust control.

3.4 Analytical Residue and Sample Preservative Residue

Field preparation and laboratory analyses will produce sample preservative and analytical residue. The characteristics will vary based on the planned analyses, but may include aqueous and organic solutions. Many chemical analyses, including those for organic and radiochemical constituents, use flammable solvents such as hexane, toluene, acetone, and methanol. Aqueous solutions produced during most chemical analyses, while usually mostly water, contain varying percentages of acids and bases such as sodium hydroxide, sulfuric acid, hydrochloric acid, nitric acid, and acetic acid. Groundwater and other aqueous samples (e.g., quality assurance samples) are often preserved with acids and occasionally with bases prior to shipment to the laboratory. Such unused material is considered sample preservative residue, rather than unaltered sample material.

3.5 Sample Containers

Split-spoon samplers, Lexan tubes, or other thin-walled sample devices are used to collect undisturbed cores of geologic material from boreholes. These may be composed of steel, aluminum, Teflon, brass, or plastic. Once used, they become a waste stream if they cannot be decontaminated for reuse. If cores retrieved from a borehole show elevated contamination levels, it will be necessary to decide if the retrieved core sampler should be decontaminated or disposed of. Only sites around the tank farm are expected to generate this type of waste.

Generally, unaltered, unused sample material is returned from the analytical laboratory in the original sample container. The empty sample container becomes a waste (for example, following return of the sample material to the source or to an appropriate waste stream). Sample containers may also become waste if the integrity of a container has been breached (for example, a broken jar) after environmental media have been containerized. Environmental media samples are typically collected in glass, Teflon, or high-density polyethylene (HDPE) containers with Teflon-coated lids. Sample containers become a waste stream if they are no longer usable and must be disposed. Waste sample containers are not expected to be a significant waste stream.

3.6 Petroleum Product Spills

A small quantity of hydraulic fluid could be generated during drilling operations. The hydraulic fluid could originate from leaks in equipment seals or through ruptured hoses. A liner beneath the drill rig and any other equipment containing hydraulic fluid will prevent spills from contaminating underlying soil, and any spills will be absorbed with a spill kit. Spill kits will consist of incinerable absorbent pillows and rags.

3.7 Purge Water

Purge water will be generated during the sampling of wells in the SRPA, with a lesser volume produced by wells in perched zones. The removal of groundwater prior to sampling is required to approximate in situ groundwater conditions in an aquifer. Typically, if groundwater production is sufficient, three well volumes of groundwater are removed prior to sample collection. Field parameters (for example, pH, conductivity, and temperature) are also used as indicators that the groundwater samples are indicative of in situ conditions. Wells installed to monitor the perched zones are not expected to produce significant volumes of groundwater. Typically, the saturated thickness in perched wells has not been sufficient to support well purging activities.

3.8 Decontamination Fluids

Decontamination of all drilling and downhole sampling equipment will keep the samples from becoming cross-contaminated. Steam cleaner and hand tool use will generate decontamination fluids. Decontamination water will be contained in a decontamination pad constructed so that collected water can be pumped into waste containers.

Sampling equipment (e.g., split barrel samplers and spoons) is decontaminated following each use. Typical equipment decontamination involves removing large soil particles with a brush or wipes followed by a soapy water wash and numerous rinses with tap and deionized water.

3.9 Contaminated Equipment

Contaminated equipment becomes a waste stream if it cannot be sufficiently decontaminated or reused for another drilling program. Based on past experience and frequent decontamination by drilling crews, a waste stream of contaminated equipment is highly unlikely. If such a waste stream were generated, it would most likely include drill pipe, core barrels, and other downhole equipment used to core and sample boreholes.

3.10 Miscellaneous Waste

Miscellaneous waste such as trash, labels, rags, and other debris will be generated during this project. Miscellaneous waste will be segregated based on the activity.

3.11 New Waste Streams

Any new waste streams must be identified and characterized. At the time of generation, a hazardous waste determination must be completed, documented, and approved through WGS. Storage, additional characterization, treatment, and final disposition of the waste will be based on the hazardous waste determination. If process knowledge is not sufficient to characterize the waste, sampling and analysis will be done to complete the characterization of the new waste stream.

4. PROJECT-GENERATED WASTE STREAMS

This drilling project supports RD/RA activities for the Group 4 perched water well installations. Because well installations will likely be done in phases, waste generated from each phase may be managed with different waste strategies. These strategies are outlined in Sections 4.3, 4.4, and 4.5. Waste minimization, segregation, packaging, and labeling are discussed in Sections 4.1 and 4.2. The characterization of these waste streams is discussed in Section 5.

4.1 Waste Minimization and Segregation

Waste will be minimized primarily through design, planning, and efficient operations. Waste streams will be segregated primarily by the field activity completed at the time of generation. For example, a waste stream from drilling in a zone of saturation will be segregated from other waste streams. A waste stream from the zone of saturation could contain radionuclides.

Except for liquids, IW is not required to be segregated by type; therefore, containers will be identified as IW and maintained outside the work area for separate collection. Other waste that may be generated during these activities includes LLW, RCRA-hazardous waste, and MLLW. Containers for this waste will be clearly labeled to identify waste type and will be maintained inside the work area until removal for subsequent waste management activities.

4.2 Packaging and Labeling

Containers that store the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) waste must be in good condition, compatible with the waste being stored, and properly labeled. It is important that containers that will also be used for waste storage (hazardous, radioactive, mixed, or industrial) are also compatible with final disposition plans. This will alleviate the need for waste repackaging prior to shipment to the SSA (for contaminated CERCLA wastes) or the INEEL Landfill Complex (for IW). The types of containers that may be used for CERCLA waste storage during this project include 208-L (55-gal) open-top drums; INEEL wooden boxes (1.2 × 1.2 × 2.4 m [4 × 4 × 8 ft] and 0.6 × 1.2 × 2.4 m [2 × 4 × 8 ft]); 2,839-L (750-gal) polyethylene stock tanks (or equivalent); 3,800- to 7,600-L (1,000- to 2,000-gal) portable containers, and 8.8 × 2.4 × 2.4-m (20 × 8 × 8-ft) steel-reinforced Sealander boxes or cargo containers. Standard 1.2 × 2.4 × 8.8-m (4 × 8 × 20-ft) open top roll containers may also be used for containment of excess soil drill cuttings.

CERCLA waste containers will be packaged and labeled to meet the Waste Acceptance Criteria (WAC) of the SSA. A copy of the label required for the SSA is found in the SSA WMP (DOE-ID 2002b). Information contained on the labels includes name of the generating facility, maximum radiation level on contact and at 1 m (3.28 ft). IW wastes to be disposed of at the INEEL Landfill Complex will be packaged and labeled according to the reusable property, recyclable materials, and waste acceptance criteria (RRWAC) document (DOE-ID 2002c).

Any of the above information not known when the waste is labeled may be added when the information is known. WGS will provide the unique bar codes for wastes other than IW. A new bar code will be affixed to each container when waste is first placed in the container. Additionally, waste labels must be visible, legibly printed or stenciled, and placed so that a full set of labels and markings is visible.

4.3 Phase I Activities

Phase I activities include four specific tasks: (1) installation of vadose zone instrumentation (tensiometers and lysimeters), (2) installation of monitoring wells, (3) collection of perched water samples, and (4) completion of a tracer test. Phase I includes installation of vadose zone instrumentation and wells at the well set locations prior to conducting the tracer test. Vadose zone well sets will be located south of the Big Lost River, west of the sewage treatment lagoons, and north of the existing percolation ponds. Phase I well sets will include an alluvial well with instrumentation installed at about 14 m [45 ft]), an upper perched water well with instrumentation installed at about 34 to 43 m (110 to 140 ft) bgs, and a lower perched water well with instrumentation installed at about 116 m (380 ft). After installation of the Phase I instrumentation and monitoring wells, perched water samples will be collected. Samples will also be collected in support of the tracer test. Volume estimates for each of the 10 anticipated waste streams are show in Table 1. Details of each waste stream are in the following sections.

Table 1. Estimated volume of waste—Phase I activities.

OU 3-13 Waste Stream	Estimated Volume
Personal protective equipment	3 m^3 (4 yd^3)
Unused and unaltered sample material	78 L (21 gal)
Soil cuttings	206.1 m^3 (269.6 yd^3)
Analytical residue and sample preservative residue	5.7 L (1.5 gal)
Sample containers	0.06 m^3 (2.2 ft^3)
Hydraulic spills	0.3 m^3 (11 ft^3)
Purge water	9,804.2 L (2590 gal)
Decontamination fluids	681.4 L (180 gal)
Contaminated equipment	NA
Miscellaneous wastes	2.3 m^3 (3 yd^3)

NA = Not applicable.

4.3.1 Personal Protective Equipment

Phase I activities will be performed primarily in drill locations selected partly because of lack of surface contamination. Estimates of PPE waste generation are based on the PPE requirements and modifications identified in Appendix H of the Group 4 MSIP, Health and Safety Plan for OU 3-13 Group 4, Perched Water (INEEL 2002). It is projected that Phase I activities will be performed by a work crew of five personnel using primarily Level D protection. Basic Level D protection consists of coveralls or work clothes, gloves, a hard hat, eye protection, and safety footwear. It is estimated that the basic Level D protection will be upgraded to a modified Level D for 20 days and Level C for a period of 10 working days. Modified Level D, for estimation purposes, will consist of radiological protective clothing (Tyvek). Level C PPE, consisting of respiratory and whole body protection upgrades, will be worn for decontamination activities within the exclusion zone. The Level C and Modified Level D protection will be changed out three times daily to facilitate work breaks and lunch. Based on this usage, it is estimated that the total volume of PPE generated during Phase I activity is 3 m^3 (4 yd^3).

4.3.2 Unused and Unaltered Sample Material

Core samples will be collected from both the unsaturated and saturated zones, depending on the hydrogeologic conditions for analysis and archiving to support future feasibility and treatability studies. Groundwater and other aqueous samples will be preserved as needed prior to shipment to the laboratory for analysis. Unused and unaltered sample material will result primarily from the collection of samples for the tracer study. These samples will be held pending the outcome of the filter analysis for tracers. If the initial analysis does not detect the tracers, then the samples will not be analyzed further and will be managed as waste. It is estimated that 50% of the sample volume will not be used for laboratory analysis, thereby generating approximately 78 L (21 gal) of liquid waste.

4.3.3 Soil Drill Cuttings

A substantial volume of soil cuttings is likely to be generated during well installation. A conservative estimate of total footage drilled at each site is 993.6 m (3,260 ft) based on the following: alluvium well (4 @ 40 ft); shallow perched water well (5 @ 130 ft); deep perched water well (5 @ 400 ft); and aquifer skimmer well (1 @ 450 ft). The nominal boring diameter is 25 cm (9⅞ in.). Based on these dimensions and a 30% expansion factor for soil, the volume of soil cuttings generated during the installation of the perched water monitoring wells is estimated at 206.1 m^3 (269.6 yd^3).

4.3.4 Analytical Residue and Sample Preservative Residue

Field preparation and laboratory analysis may produce sample preservation and analytical residues. The characteristics of these will vary based on the planned analyses, but will include both aqueous and organic solutions. Many chemical analyses, including those for organic and radiochemical substances utilize flammable solvents such as hexane, toluene, acetone, and methanol. Aqueous solutions produced during most chemical analyses, while usually mostly water, contain varying percentages of acids and bases, such as sodium hydroxide, sulfuric acid, hydrochloric acid, nitric acid, and acetic acid. Groundwater and other aqueous samples (e.g., quality assurance samples) are often preserved with acids and occasionally with bases prior to shipment to the laboratory. These are considered sample preservation residues, rather than unaltered sample materials.

Analytical residues/sample preservative residues would result from aqueous samples preserved, using acidic/basic solutions. Unless contaminated with polychlorinated biphenyls (PCBs) or dioxins, the off-Site laboratory manages this waste stream in accordance with 40 CFR 261.4(15)(d) and the applicable Sample and Analysis Management (SAM) contract. The volume of analytical residues/sample preservative residues, which may be generated, is estimated at less than 5.7 L (1.5 gal).

4.3.5 Sample Containers

Sample containers become a waste stream if they are no longer usable and disposal is required. Sample containers may become waste if the integrity of a container has been breached (for example, a broken jar). The volume of waste sample containers generated during the installation of the perched wells is estimated at 0.06 m^3 (2.2 ft^3).

4.3.6 Hydraulic Spills

A small quantity of hydraulic fluid could be spilled during drilling operations. A liner beneath the drill rig and any other equipment containing hydraulic fluid will prevent spills from contaminating underlying soil. Spills will be absorbed with absorbent wipes (diapers). The volume of wipes soaked with hydraulic fluid is estimated at 0.3 m^3 (11 ft^3).

4.3.7 Development and Purge Water

The installation of the Phase I perched water wells and instrumentation is not expected to generate significant volumes of purge water. Saturated thicknesses are often insufficient to support the removal of three well volumes of groundwater. However, the development and tracer testing of the aquifer well will generate an estimated 7,570.8 L (2,000 gal) of water. The remaining wells are projected to generate minor volumes of water during well development, sampling, and the tracer test. The total volume of development and purge water during Phase I activities is estimated at 9,804.2 L (2,590 gal).

4.3.8 Decontamination Fluids

Decontamination of the drilling and downhole sampling equipment ensures that the environmental samples are not cross-contaminated. The drill pipe will be decontaminated before it is moved to each new drilling location. Dry decontamination methods will be attempted before decontamination with fluids. A steam cleaner and hand tools will generate decontamination fluids. If necessary, decontamination water will be contained in a decontamination pad constructed so that collected water can be pumped into waste containers.

Sample equipment such as split barrel samplers and spoons will also be decontaminated following each use. Typical equipment decontamination involves removal of large soil particles with a brush or wipes followed by a soapy water wash and numerous rinses with tap water and deionized water.

The estimated volume of decontamination water produced during drilling equipment decontamination is estimated at 567.8 L (150 gal), assuming 38 L (10 gal) is generated at each borehole well. Sample equipment decontaminated during the tracer testing is estimated to generate a total of 113.6 L (30 gal) of decontamination water, assuming 7.6 L (2 gal) is generated at each sampling site. The estimated volume of decontamination water produced during the Phase I activities is 681.4 L (180 gal).

4.3.9 Contaminated Equipment

Contaminated equipment becomes waste if it is contaminated by radionuclides or hazardous waste and cannot be decontaminated. Based on past experience and frequent decontamination by drilling crews, a waste stream of contaminated equipment is highly unlikely, so a volume estimate has not been included.

4.3.10 Miscellaneous Waste

Miscellaneous waste such as trash, labels, rags, and other debris will be generated during the project. The volume of miscellaneous waste generated during Phase I activities is estimated at 2.3 m^3 (3 yd^3).

4.4 Phase II Well Installation

Phase II wells are located around the tank farm, an area with radiological, chemical, and RCRA-waste contamination. Well installation will consist of a shallow perched well to the 34- to 43-m (110- to 140-ft) level, a deep perched zone well to the deeper 116-m (380-ft) interbed, and a well to the top of the aquifer at 137 m (450 ft). After installation, each perched water well will be sampled. Volume estimates for each of the anticipated waste streams are shown in Table 2. Details for each waste stream are in the following sections.

Table 2. Estimated volume of waste—Phase II well installation.

OU 3-13 Waste Stream	Estimated Volume
Personal protective equipment	7.6 m^3 (10 yd^3)
Unused and unaltered sample material	0.76 m^3 (1 yd^3)
Soil cuttings	123.9 m^3 (162.1 yd^3)
Analytical residue and sample preservative residue	11.4 L (3 gal)
Sample containers	0.06 m^3 (2.2 ft^3)
Hydraulic spills	0.3 m^3 (11 ft^3)
Purge water	28,390.6 L (7,500 gal)
Decontamination fluids	454.2 L (120 gal)
Contaminated equipment	NA
Miscellaneous waste	1.52 m^3 (2 yd^3)

NA = Not applicable.

The concentrations of contaminants that may be in wastes generated as part of the Phase II work are difficult to predict. Past sampling and analysis of soil in the vicinity of the tank farm have indicated a wide range of radionuclide activity which is nondetectable to very low concentrations of organic and inorganic constituents. All drilling for this phase will be outside of areas of known releases; therefore, it is not expected that remote-handled waste will be generated.

4.4.1 Personal Protective Equipment

Estimates of PPE waste generation for Phase II activities is based on the PPE requirements identified in Appendix H, Health and Safety Plan for OU 3-13, Group 4, Perched Water (INEEL 2002). It is projected that a work crew of five personnel with Level D protection will perform the majority of work activities. Basic Level D protection consists of coveralls or work clothes, gloves, a hardhat, eye protection, and safety footwear. It is estimated that the basic Level D protection will be upgraded to a Modified Level D for 40 days and Level C for 30 working days. Modified Level D, for estimation purposes, will consist of radiological protective clothing (Tyvek). Level C PPE, consisting of respiratory and whole body protection upgrades, will be worn for decontamination activities within the exclusion zone. The Level C and Modified Level D protection will be changed out three times daily to facilitate work breaks and lunch. Based on this usage, it is estimated that the total volume of PPE generated during Phase I activity is 7.6 m^3 (10 yd^3).

4.4.2 Unused and Unaltered Sample Material

Core samples will be collected from both the unsaturated and saturated zones, depending on the hydrogeologic conditions. Soil cores will be archived to support future feasibility and treatability studies. Groundwater and other aqueous samples will be preserved as needed prior to shipment to the laboratory for analysis. The volume of unused and unaltered sample material from the installation of the perched water wells is estimated at 0.76 m^3 (1 yd^3).

4.4.3 Soil Drill Cuttings

A substantial volume of soil cuttings is likely to be generated during well installation. A conservative estimate of total footage drilled at each site is 597.4 m (1960 ft) based on the following: shallow perched water well (2 @ 130 ft); deep perched water well (2 @ 400 ft) and aquifer skimmer well (2 @ 450 ft). The nominal boring diameter is 25 cm (9⅞ in.). Based on these dimensions and a 30% expansion factor for soil, the volume of soil cuttings generated during the installation of the perched water monitoring wells is estimated at 123.9 m^3 (162.1 yd^3).

4.4.4 Analytical Residue and Sample Preservative Residue

Analytical residue and sample preservative residue could result from contaminated soil samples and aqueous samples preserved with acidic or basic solutions. The volume of analytical residue and sample preservative residue is estimated at less than 11.4 L (3.0 gal). Unless the residue is contaminated with PCBs or dioxins, the off-Site laboratory will be responsible for managing this waste stream in accordance with its SAM contract.

4.4.5 Sample Containers and Lexan Tubes

Sample containers become a waste stream if they are no longer usable and disposal is required. Sample containers may become waste if the integrity of a container has been breached (for example, a broken jar) during sample collection activities. The volume of waste sample containers and Lexan tubes generated during the installation of the perched well is estimated at 0.06 m^3 (2.2 ft^3).

4.4.6 Hydraulic Spills

A small quantity of hydraulic fluid could be spilled during drilling operations. A liner beneath the drill rig and any other equipment containing hydraulic fluid will prevent spills from contacting underlying soil. Spills will be absorbed with absorbent wipes (diapers). The volume of wipes soaked in hydraulic fluid generated as waste is estimated at 0.3 m^3 (11 ft^3).

4.4.7 Development and Purge Water

The installation of the perched water wells during Phase II is not expected to generate significant volumes of purge water. Saturated thicknesses are often insufficient to support the removal of three well volumes of groundwater. However, the development and purging of the Phase II aquifer wells will generate an estimated 26,497.9 L (7,000 gal) of water. The remaining wells are projected to generate minor volumes of water during well development, sampling, and the tracer test. The total volume of development and purge water during Phase II activities is estimated at 28,390.6 L (7,500 gal).

4.4.8 Decontamination Fluids

Decontamination of the drilling equipment ensures that the environmental samples are not cross-contaminated. The drill pipe will be decontaminated before it is moved to each new drilling location. Dry decontamination methods will be attempted before decontamination with fluids. A steam cleaner and hand tools will generate decontamination fluids. If necessary, decontamination water will be contained in a decontamination pad constructed so that collected water can be pumped into waste containers. The estimated volume of decontamination water produced during drilling equipment decontamination is estimated at 454.2 L (120 gal), assuming 76 L (20 gal) is generated at each borehole well.

4.4.9 Contaminated Equipment

Contaminated equipment becomes a waste if it cannot be decontaminated. Based on past experience and frequent decontamination by drilling crews, a waste stream of contaminated equipment is highly unlikely, so a volume estimate has not been included.

4.4.10 Miscellaneous Wastes

Miscellaneous waste such as trash, labels, rags, and other debris will be generated during the project. The volume of miscellaneous waste is estimated at 1.52 m^3 (2 yd^3).

4.5 Phase II Routine Sampling

Routine monitoring of the perched water is a requirement of the WAG 3 OU 3-13 ROD. The routine sampling events will continue for at least 5 years after the relocation of the percolation ponds. For the purposes of estimating waste volumes, a 5-year monitoring period is assumed. Table 3 provides estimated waste volumes for this phase. The scope of these routine monitoring activities is defined in the MSIP (DOE-ID 2000).

Table 3. Estimated volume of waste—Phase II well sampling.

OU 3-13 Waste Stream	Estimated Volume
Personal protective equipment	2.3 m^3 (3 yd^3)
Unused and unaltered sample material	19 L (5 gal)
Analytical residue and sample preservative residue	19 L (5 gal)
Sample containers	0.01 m^3 (4 ft^3)
Purge water	8327.9 L (2,200 gal)
Decontamination fluids	1,514 L (400 gal)
Contaminated equipment	NA
Miscellaneous waste	0.76 m^3 (1 yd^3)

NA = Not applicable.

4.5.1 Personal Protective Equipment

Estimates of PPE waste generation for Phase II sampling are based on the PPE requirements and modifications identified in Appendix H, Health and Safety Plan for OU 3-13 Group 4, Perched Water (INEEL 2002). It is projected that Phase II sampling activities will be performed by a sampling crew of two personnel using primarily with Level D protection. Basic Level D protection consists of coveralls or work clothes, gloves/hand protection, a hardhat, eye protection, and safety footwear. Due to potential contamination, it is estimated that Level C protection will be required for sampling five of the perched water wells. It is projected that the PPE wastes that will be generated from sampling using Level D protection will primarily consist of hand protection. During the 5 years of monitoring, it is estimated that the sampling activities will generate 2.3 m^3 (3 yd^3).

4.5.2 Unused and Unaltered Sample Material

Groundwater and other aqueous samples will be preserved as needed prior to shipment to the laboratory for analysis. Unused and unaltered sample material may also be generated that will be determined to be a waste. The volume of unused and unaltered sample material from the routine Phase II sampling is estimated at 19 L (5 gal).

4.5.3 Analytical Residue and Sample Preservative Residue

The volume of analytical residue and sample preservative residue is estimated at less than 19 L (5 gal).

4.5.4 Sample Containers

Sample containers become a waste stream if they are no longer usable and disposal is required. Sample containers may become waste if the integrity of a container has been breached (for example, a broken jar) during soil sampling while perched water wells are being installed or during groundwater collection activities. The volume of waste sample containers generated during the installation of the perched well is estimated at 0.01 m^3 (4 ft^3).

4.5.5 Purge Water

The perched wells will produce limited volumes of purge water. The volume of purge water from the routine sampling of monitoring wells is estimated at 8,327.9 L (2,200 gal).

4.5.6 Decontamination Fluids

Decontamination of all sampling equipment ensures that the environmental samples are not cross-contaminated. Any nondedicated sampling equipment will also be decontaminated prior to use at a new location. The volume of decontamination water produced during 5 years of monitoring is estimated at 1,514 L (400 gal).

4.5.7 Contaminated Equipment

Contaminated equipment becomes a waste if it cannot be decontaminated. Based on past experience and frequent decontamination by sampling crews, a waste stream of contaminated equipment is highly unlikely, so a volume estimate has not been included.

4.5.8 Miscellaneous Waste

Miscellaneous waste such as trash, labels, rags, and other debris will be generated during the project. The volume of miscellaneous waste generated during the life of the project is estimated at 0.76 m^3 (1 yd^3).

5. WASTE STREAM CHARACTERIZATION

Wastes generated by the implementation of the MSIP for Operable Unit 3-13, Group 4, Perched Water (DOE-ID 2000), are CERCLA remediation wastes. These wastes will be characterized to support a hazardous waste determination (IDAPA 58.01.05.006 (40 CFR 264.554) and provide information for follow-on management. Because these activities investigate both the perched water and the SRPA, different types of solid waste could be generated. The contaminated wastes are CERCLA hazardous substances and may be further characterized as a LLW, RCRA-listed, RCRA-characteristic, or MLLW, depending on contaminants. Uncontaminated wastes may be characterized as a IW. The general strategy for characterizing waste is described in Section 5.1. Sections 5.2 through 5.12 specify the waste characterization that is anticipated for each waste category.

5.1 Characterization Strategy

All waste generated during this project will be characterized in accordance with 40 CFR 262.11, 10 CFR 835, DOE O 435.1, and DOE O 5400.5 to facilitate storage and disposal. Based on this characterization, a hazardous waste determination will be performed for each waste stream. Since the drilling and sampling activities will encounter both saturated and unsaturated conditions, different types of solid waste could be generated. The SRPA groundwater is likely to be contaminated with radionuclides while the unsaturated zone may not be contaminated. The waste determinations could identify IW, LLW, MLLW, or RCRA-characteristic or listed hazardous waste. Except for IW, waste will be (a) stored during drilling and drilling equipment decontamination in a CERCLA waste storage area (WSA) located to support each well set or (b) transferred to the SSA for subsequent management. Characterization and management of waste in the SSA will be conducted according the SSA WMP (DOE-ID 2002b).

The groundwater downgradient of INTEC has been impacted by past releases from the facility, primarily through the Idaho Chemical Processing Plant injection well (CPP-23). Wastes that were injected into the well are now considered RCRA-listed wastes. The groundwater, by way of the "contained-in" rule could therefore carry the listed numbers. However, a no-longer-contained-in (NLCI) determination for SRPA groundwater from the State of Idaho Department of Environmental Quality (IDEQ) is currently pending. Characterization of the CERCLA wastes and performance of the hazardous waste determination will evaluate all available information, including any NLCI approvals granted by IDEQ and identify any RCRA waste codes and radionuclide information to facilitate management of the waste at the SSA. It is anticipated that most waste will be transferred to the SSA with partial characterization. Characterization will be completed at the SSA upon receipt of the results from sampling activities.

Each waste stream will also be managed in accordance with 10 CFR 835 and DOE Orders 435.1 and 5400.5. Any waste stream determined through analytical testing to contain radionuclides above the risk-based action level for no action (in soil) or maximum contaminant levels (MCLs) (in water) will be classified as a LLW or MLLW, as applicable. For water, MCLs will be used to guide waste stream characterization or radionuclides. All water will be contained pending analytical testing at the laboratory. Water containing levels of radionuclides above MCLs will be characterized as LLW or MLLW, as applicable. Table 4 provides a summary of the MCLs for those COCs identified for Group 4.

Table 5 summarizes the waste characterization possibilities for the waste streams generated during the Group 4 SRPA project as described in Section 3.

Most of the Group 4 SRPA project will generate PPE that is IW since the drilling locations are areas with no known or suspected surface contamination. This PPE will be bagged for disposal at the INEEL Landfill Complex. PPE generated during drilling in the saturated zone may be LLW or MLLW and will be containerized and stored in the SSA pending disposition.

Table 4. Maximum contaminant levels.

Contaminant of Concern	Maximum Contaminant Levels	Decay Type
Beta-gamma emitting radionuclides	Total of beta-gamma emitting radionuclides shall not exceed 4 mrem/yr effective dose equivalent[a]	Beta-gamma
Sr-90 and daughters[b]	8 pCi/L	Beta
Tritium[a] (H-3)	20,000 pCi/L	Beta
I-129	1 pCi/L[b]	Beta-gamma
Alpha-emitting radionuclides	15 pCi/L total alpha-emitting radionuclides[c]	Alpha
Uranium and daughters	15 pCi/L	Alpha
Np-237 and daughters	15 pCi/L	Alpha
Plutonium and daughters	15 pCi/L	Alpha
Am-241 and daughters	15 pCi/L	Alpha
Nonradionuclides		
Chromium	100 µg/L	Not applicable
Mercury	2 µg/L	Not applicable

a. Both Sr-90 and H-3 contribute toward the total of 4 mrem/yr.

b. Derived concentration if only beta-gamma radionuclide is present.

c. All alpha-emitters count when determining if the 15 pCi/L MCL is exceeded.

Table 5. SRPA monitoring well installation—unused/unaltered sample material.

OU 3-13 Waste Stream	Industrial	Low-Level Waste	Low-Level Mixed[a]	RCRA Characteristic[b]
Personal protective equipment	O[c]	O	O	X[d]
Unused/unaltered sample material	X	O	O	X
Drill cuttings-unsaturated	O	X	O	X
Drill cuttings-saturated	X	X	O	O
Analytical residues	O	O	X	X
Sample containers	X	O	O	X
Petroleum product spills	O	X	X	X
Purge water (saturated zone)	X	X	O	O
Decontamination fluids	X	X	O	X
Contaminated equipment	Not possible	X	O	O
Miscellaneous waste	O	X	X	X

a. MLLW for these waste streams would be LLW and RCRA-characteristic or listed hazardous waste.

b. RCRA-characteristic waste per 40 CFR 261.24.

c. O denotes probable (most likely) characterization for the waste stream.

d. X denotes possible characterization for the waste stream.

5.2 Monitoring Well Phased Installation

The perched water zones beneath INTEC can be differentiated into a northern and a southern perched water body, based on the source of contaminants. Contaminants in the northern perched water are largely associated with releases from the tank farm and the INTEC injection well (CPP-23). Waste generated from this area would likely be characterized as mixed waste (INEEL 1999). The perched monitoring well installation has been phased to address different topics. This phasing will also allow better waste management, because waste from around the tank farm must be managed differently from clean area waste.

5.3 Personal Protective Equipment

5.3.1 PPE, Contamination Control, and Decontamination Waste Classified as Mixed Waste

The Group 4 perched water well installation project could generate waste with listed waste codes plus radioactivity above background. It is anticipated that this type of waste will be generated primarily during Phase II drilling. However, a lesser amount may be generated during Phase I drilling in saturated conditions.

Typically, PPE, contamination control supplies, and other miscellaneous waste are characterized based on the characteristics of the site or activity generating the waste. For example, PPE used during Phase II drilling will be assumed to be contaminated with the same contaminants detected during analytical testing of soil samples collected at the site, as well as associated listed waste constituents.

The PPE, contamination control supplies, and other miscellaneous waste will be assessed to determine if they are contaminated with F001, F002, F005, and U134[a] wastes (even if these are not detected in analysis) and the waste numbers will be identified, as deemed appropriate.

5.3.2 PPE, Contamination Control, and Decontamination Waste Classified as Industrial Waste

Phase I and Phase II activities will generate PPE waste that is primarily IW since the drilling locations were selected partly based on the lack of surface contamination. This PPE waste will be bagged for disposal at the Central Facilities Area (CFA) landfill. Certain drilling operations into the saturated interbeds could generate MLLW as discussed in Section 5.3.1. The PPE used in these drilling operations will be segregated from the IW PPE and screened in the field for radioactivity. If the field screening indicates radioactivity above background levels, then the PPE will be managed as LLW and sent to SSA for management. Preparation and approval of a company Form 435.02, No Radioactivity Added Certification, may be required for approval to dispose of the waste as IW. The form, available through the INEEL intranet home page, may be completed using process knowledge about the site where the waste was generated or based on the sampling and analysis results for soil and groundwater media there.

---

a. The State of Idaho granted a site-specific treatment variance to the INEEL for nonliquid U134 waste, and these treatment standards will not be identified on LDR notification and certification forms.

5.4 Unused and Unaltered Sample Material

Core samples from the perched water drilling may be from saturated zones or from unsaturated zones, depending on the hydrogeologic characteristics. These cores will be archived to support future feasibility and treatability studies. These cores will be screened in the field for radionuclides and analyzed at the laboratory to support characterization. Cores that do not exhibit elevated levels of radioactivity will be stored at the U.S. Geological Survey (USGS) core library. Cores determined to be LLW will be stored in a designated Radioactive Materials Area (RMA). Unused and unaltered sample material that is returned from the laboratory will be characterized and appropriate waste codes and classifications applied.

5.5 Soil Cuttings

Cuttings generated during drilling above the saturated zone will not be impacted by radionuclides. However, the cuttings from the saturated zone are likely to contain radionuclides and will need to be assessed to determine if they have come into contact with listed wastes. Possible characterization categories for this waste include LLW and MLLW. To ensure protection, the Phase I and II cuttings will be containerized and stored at the SSA until sampling results are available and the hazardous waste determination is performed. If it is determined that the cuttings do not contain a mixed waste and the concentrations in the cuttings are below the remediation goals or action levels for Group 3 sites, the cuttings may be used for other needs according to the *Institutional Control Plan for the INTEC Waste Area Group 3, Operable Unit 3-13* (DOE-ID 2001). Cuttings with RCRA-listed wastes or those that are above the risk-based action levels will be stored in the SSA awaiting disposition to the INEEL CERCLA Disposal Facility (ICDF).

5.6 Analytical Residue and Sample Preservative Residue

Analytical residues/sample preservative residues would likely be considered RCRA-characteristic waste if not neutralized by the laboratory. Analytical residues/sample preservative residues will be stored and disposed by the off-Site laboratory in accordance with the SAM contract and 40 CFR 261.4(d).

5.7 Sample Containers

Contaminated sample containers may be classified as RCRA-characteristic based on the preservatives used and may also be a LLW. However, if properly emptied and containing less than 1 in. of residue, they are no longer regulated under RCRA (empty container rule, 40 CFR 261.7) and would be designated as an IW or LLW, dependent upon radionuclide contamination. IW would be dispositioned at the INEEL Landfill Complex. LLW would be sent to the SSA for management.

5.8 Petroleum Spills

Used petroleum spill kit material will be classified as IW, stored in appropriate containers, and dispositioned in the INEEL Landfill Complex.

5.9 Development and Purge Water

All purge water will be containerized for storage at the SSA awaiting final characterization. Possible waste designations for the development and purge water include LLW or MLLW. These designations will be based on radionuclide analysis and applicable listed waste codes applied to perched water and groundwater inside the INTEC fence. All development and purge water will be containerized and stored at the SSA pending completion of characterization and subsequent management.

5.10 Decontamination Fluids

Decontamination fluids are anticipated to be LLW or MLLW. These fluids will be containerized and placed in storage at the SSA pending completion of characterization and subsequent management.

5.11 Contaminated Equipment

Contaminated equipment becomes a waste if it cannot be decontaminated. Based on past experience and frequent decontamination by drilling crews, a waste stream of contaminated equipment is highly unlikely. If generated, contaminated equipment would be expected to be LLW or MLLW and would be stored at the SSA awaiting disposal at the ICDF.

5.12 Miscellaneous Waste

Miscellaneous waste such as trash, labels, rags, and other debris will be generated during the installation of the perched water wells. Clean miscellaneous waste (produced during drilling in unsaturated zones) would be segregated for disposition to the INEEL Landfill Complex. All other miscellaneous waste would be characterized as LLW or MLLW.

6. WASTE STREAM STORAGE AND INSPECTION

Storage of the various waste streams generated during implementation of Phase I and II activities will be based on waste characterization. This section provides an overview of the storage of CERCLA waste streams, followed by more detailed information on storage of the various waste streams. Based on characterization, the CERCLA wastes may be characterized as IW, LLW, RCRA-hazardous, or MLLW.

Except for IW, waste will be stored during drilling, and the drilling equipment decontamination will be placed in a CERCLA WSA located to support each well set or in the SSA. Each CERCLA WSA will provide temporary waste storage during Phase I and II drilling activities at the specific well set. This storage will cease upon completion of the drilling activities, and equipment decontamination for the set of wells and the WSA will be closed. This waste storage will be performed in a CERCLA WSA.

Due to the potential that the CERCLA-generated wastes may also be a RCRA-hazardous waste, LLW, or MLLW, the WSA will be operated in compliance with the RCRA ARARs. Containers in the WSA with CERCLA-generated waste will be labeled with the words "CERCLA WASTE" and with appropriate hazardous waste numbers, if known. Boxes and containers will be labeled on two sides (both visible) and centered (two labels needed). Drums will be labeled on the side, centered and visible (only one label needed). A copy of the label that will be used for CERCLA wastes is included in the WMP for the SSA (DOE-ID 2002b). A waste profile will be used to support the management of the waste at the WSA and the SSA. The waste profile will provide pertinent information such as the description of the waste, contaminants of potential concern, known U.S. Environmental Protection Agency waste numbers, radiation levels, operable unit, name and phone number of the generator point of contact, and container description.

Secondary containment will be provided for liquid wastes. This will be accomplished by using containers that are designed and constructed to have built-in secondary containment or by placement of an impermeable liner/physical barrier at the drill site to contain any stored liquid wastes. Nonaqueous wastes that are not IW will be packaged or containerized to facilitate storage and subsequent transport to the SSA for further characterization and management. The emergency response procedures established in applicable company polices and procedures will be used for the drill site WSA activities and notifications. Upon completion of the drilling activities and equipment decontamination, all containers of contaminated waste remaining at the WSA will be transported to the SSA for management. Inspection of the SSA WSA, container requirements, recordkeeping, labeling will be conducted according to the SSA WMP (DOE-ID 2002b) and are not presented in this WMP.

Inspections of each WSA will be performed weekly to ensure protectiveness and will include inspecting the following:

- Containers to ascertain their condition, to determine the presence of required labels, and to ensure that incompatible waste is not placed in the area

- Storage area to ascertain any deficiencies (e.g., housekeeping, aisle space, emergency equipment)

- Logbook to ensure inventory records are up to date and that incompatible waste is not placed in the area.

On a frequency determined by radiological control personnel and based on the area designation and as low as reasonably achievable (ALARA) considerations, the storage areas will also be surveyed for radiation and contamination. Containers with signs of damage that may compromise container integrity will be replaced as soon as possible. The containers in each storage area will be labeled with CERCLA and radioactive waste labels, as applicable. The standardized CERCLA labels are identified in the SSA WMP (DOE-ID 2002b). All container labels will be placed so that they are clearly visible and in accordance with the specifications identified in the SSA WMP.

Upon completion of drilling activities, the contaminated CERCLA waste will be transferred to the SSA and the WSA will be closed. Wastes will be stored in the SSA to await sampling results for completion of characterization and subsequent disposition. The characterization and management of wastes in the SSA will be conducted according the SSA WMP (DOE–ID 2002b) and are not presented in this WMP.

6.1 Personal Protective Equipment

The perched water activities are expected to generate PPE waste that is primarily classified as IW. PPE will be segregated according to field activity, field radiation screening, and saturated drilling conditions. PPE used during the unsaturated drilling will be bagged in clear plastic bags and labeled as IW. A description must be with the waste, and the description must adequately define the characteristics of the waste in the bags.

PPE used during saturated drilling or during drilling of material above background radiation levels will likely be classified as LLW based on current waste determinations. This PPE will be bagged and labeled as previously identified.

6.2 Unused and Unaltered Sample Material

Unused and unaltered samples (for example, core samples) will be archived to support future feasibility and treatability studies. These cores will be analyzed for radionuclides to support the characterization. Cores that do not exhibit elevated levels of radioactivity will be stored at the USGS core library. Cores exhibiting radioactivity above background levels will be stored in an RMA for future evaluation. Project personnel will annually inspect the RMA to evaluate the need for continued storage.

6.3 Soil Cuttings

The storage of soil cuttings will be based on drilling conditions, using field radiation screening and subsurface saturation as the criteria. Cuttings will be contained in appropriate containers such as 208-L (55-gal) drums, poly containers, or roll-off boxes during drilling and evaluated for radionuclides. The containers will be labeled and managed in the WSA until the drilling and equipment decontamination has been completed.

6.4 Analytical Residue and Sample Preservative Residue

Analytical residue and sample preservative residue would result if aqueous samples were preserved with nitric acid or sodium hydroxide. They would be considered RCRA-characteristic waste, D002, per 40 CFR 261.22, if the pH is less than 2.0 or greater than 12.5. Analytical residue and sample preservative residue will be stored and disposed of by the off-Site laboratory, unless the samples contain PCBs. PCBs are not contaminants of concern for the perched water drilling.

6.5 Sample Containers

Sample containers that become contaminated will be placed in appropriate containers, anticipated to be 19-L (5-gal) containers. The containers will be labeled and transported to the SSA for management.

6.6 Hydraulic Spills

Hydraulic fluid spills will be contained using conventional absorbent spill kits. The used spill kit material will be classified as IW and stored in 208-L (55-gal) drums. Final disposition of the hydraulic fluid would be to the CFA landfill.

6.7 Development and Purge Water

Development and purge water from monitoring wells will be placed in a container(s) such as a frac tank or 2,839-L (750-gal) polyethylene container (or equivalent). The containers will be labeled and the liquids will be transported to the SSA for storage pending receipt of radionuclides and chemical analysis and follow-on management.

6.8 Decontamination Fluids

Equipment will be decontaminated at the well site upon completion of the drilling or sampling activity. Used decontamination fluids and wastes will be contained within a decontamination pad and collected in containers compatible with the wastes. The containers will be labeled and the wastes will be transported to the SSA for management pending receipt of radionuclides and chemical analysis.

6.9 Contaminated Equipment

Contaminated equipment becomes a waste if it cannot be decontaminated. Based on past experience and frequent decontamination by drilling and sampling crews, a waste stream of contaminated equipment is highly unlikely. Storage of any contaminated equipment will depend on the size of the contaminated equipment. Small equipment (for example, hand tools) will be stored in 19-L (5-gal) or 208-L (55-gal) drums. Contaminated equipment will be packaged, labeled, and transported to the SSA for storage, completion of characterization, and subsequent management.

6.10 Miscellaneous Waste

Miscellaneous wastes such as trash, labels, rags, and other debris will be screened for radioactivity in the field. If radioactivity is at background levels and the hazardous waste determination identifies that there are no hazardous waste codes that would apply, then the miscellaneous waste will be bagged for disposal at the CFA landfill.

All other miscellaneous waste will be characterized as LLW or MLLW, depending on the site of generation and hazardous waste determination. This waste will be bagged, containerized, labeled, and transported to the SSA for management.

7. WASTE STREAM DISPOSITION

The implementation of Phase I and II activities will generate CERCLA remediation wastes that will be disposed of at the Staging, Storage, Sizing, and Treatment Facility (SSSTF)/ICDF or the INEEL Landfill Complex at the CFA. Specifically, the IW will be disposed of at the INEEL Landfill Complex in accordance with the protocols in the RRWAC. The IW will be turned over to WGS personnel for management under existing facility waste streams and in accordance with standing facility procedures. IW does not include contaminated CERCLA remediation waste (contaminated with radioactivity, PCBs, or RCRA-hazardous waste) and must be in compliance with the RRWAC. When sufficient quantities of IW have been accumulated, WGS will complete Form 435.39, INEEL Waste Determination and Disposition Form. Completing this form may require further evaluation of process knowledge and additional characterization. WGS will manage the waste from the generator to disposal at the CFA landfill.

CERCLA wastes will be disposed at the ICDF if the waste meets the Waste Acceptance Criteria (WAC) for the ICDF. To support the ICDF, a waste SSSTF will be constructed. The SSSTF will have a storage and staging building, an evaporation surface impoundment, a waste shredder, solidification and stabilization tanks, and support equipment. A corrective action management unit (CAMU) will be designated to manage ICDF leachate and other aqueous waste generated by the operation of the ICDF. An evaporation pond will be designated a CAMU and will be operated in accordance with the requirements in 40 CFR 264.552.

8. RECORDKEEPING AND REPORTING

The following sections describe how records and reports will be managed. These records and reports will be maintained with the OU 3-13, Group 4, Perched Water, project files at the INTEC, as appropriate.

8.1 Waste Generation and Characterization Records

Records related to OU 3-13 waste generation and characterization generated during field operations include those shown below and will be maintained as outlined in the applicable company procedures and the waste management procedures (IW, LLW, RCRA-hazardous, or MLLW). These waste generation and characterization records include

- Sampling and testing data
- Sample quality control and quality assurance documentation
- Chain-of-custody forms
- Field sampling plans
- Sampling and analysis logbook
- Field team leader logbook
- Well drilling logbook
- INEEL Waste Tracking System (IWTS) material profile
- IWTS container profile.

8.2 Waste Storage

Records associated with waste storage at the CERCLA WSA will include the following:

- Registration Form 450.02, Hazardous Waste Accumulation Area Registration Form
- Contingency plan
- Job descriptions and training records
- Inspection records
- Spill notifications
- Spill cleanup records.

8.3 Waste Transport, Treatment, and Disposition

Records related to waste transport, treatment, and disposition will be maintained by OU 3-13, WGS, and P&T personnel, as appropriate. The treatment and disposal of the CERCLA wastes will be performed in accordance with the ICDF WAC.

9. REFERENCES

10 CFR 835, 2000, “Occupational Radiation Protection,” *Code of Federal Regulations*, Office of the Federal Register, January 2000.

40 CFR 261.4, 1999, “Exclusions,” *Code of Federal Regulations,* Office of the Federal Register, July 1999.

40 CFR 261.7, 1999, “Residues of Hazardous Waste in Empty Containers,” *Code of Federal Regulations*, Office of the Federal Register, July 1999.

40 CFR 261.22, 1999, “Characteristic of Corrosivity,” *Code of Federal Regulations,* Office of the Federal Register, July 1999.

40 CFR 261.24, 1999, “Toxicity Characteristic,” *Code of Federal Regulations,* Office of the Federal Register, July 1999.

40 CFR 262.11, 1999, “Hazardous Waste Determination,” *Code of Federal Regulations*, Office of the Federal Register, July 1999.

40 CFR 264.552, 1999, “Corrective Action Management Unit,” *Code of Federal Regulations*, Office of the Federal Register, July 1999.

40 CFR 264.554, 1999, “Staging Piles,” *Code of Federal Regulations,* Office of the Federal Register, July 1999.

DOE O 435.1, Change 1, 2001, “Radioactive Waste Management,” U.S. Department of Energy, August 2001.

DOE O 5400.4, Change 2, “Radiation Protection of the Public and the Environment,” U.S. Department of Energy Idaho Operations Office, January 7, 1993.

DOE-ID, 1997, *Comprehensive Remedial Investigation/Feasibility Study (RI/FS) for the Idaho Chemical Processing Plant OU 3-13 at the INEEL, Part A, RI/BRA Report (Final),* DOE/ID-10534, Rev. 0, U.S. Department of Energy Idaho Operations Office, November 1997.

DOE-ID, 1999, *Final Record of Decision, Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13*, DOE/ID-10660, Rev. 0, U.S. Department of Energy Idaho Operations Office, October 1999.

DOE-ID, 2000, *Monitoring System and Installation Plan for Operable Unit 3-13, Group 4, Perched Water Well Installation*, DOE/ID-10774, Rev. 0, U.S. Department of Energy Idaho Operations Office, September 2000.

DOE-ID, 2001, *Institutional Control Plan for the INTEC Waste Area Group 3, Operable Unit 3-13,* DOE/ID-10729, Rev. 1, U.S. Department of Energy Idaho Operations Office, March 2001.

DOE-ID, 2002a, *Field Sampling Plan for Operable Unit 3-13, Group 4 Perched Water Wells Installation*, DOE/ID-10745, Rev. 1, U.S. Department of Energy Idaho Operations Office, December 2002.

DOE-ID, 2002b, *Waste Management Plan for the Staging and Storage Annex (CPP-1789)*, DOE/ID-10800, Rev. 2, U.S. Department of Energy Idaho Operations Office, September 2002.

DOE-ID, 2002c, *INEEL Reusable Property, Recyclable Material, and Waste Acceptance Criteria*, DOE/ID-10381, Rev. 13, U.S. Department of Energy Idaho Operations Office, December 2002.

IDAPA 58.01.05.006, 2002, "Standards Applicable to Generators of Hazardous Waste," Idaho Administrative Procedures Act, Idaho Department of Environmental Quality, March 2002.

INEEL, 1997, *Waste Certification Plan for the Environmental Restoration Program*, INEL-96/0043, Rev. 1, Idaho National Engineering and Environmental Laboratory, October 1997.

INEEL, 1999, *A Regulatory Analysis and Reassessment of U.S. Environmental Protection Agency Listed Waste Hazardous Waste Numbers for Applicability to the INTEC Liquid Waste System*, INEEL/EXT-98-01213, Rev. 1, Idaho National Engineering and Environmental Laboratory, February 1999.

INEEL, 2002, *Health and Safety Plan for Operable Unit 3-13, Group 4, Perched Water Project*, INEEL/EXT-2000-00257, Rev. 1, Idaho National Engineering and Environmental Laboratory, December 2002.